AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (*Currently amended*) A two-dimensional code reading method comprising processing steps of:

acquiring an image of a ~~matrix type~~ two-dimensional matrix code composed of a number of cells arranged in vertical and horizontal directions to form a matrix of the cells each representing binary coded data,

deciding a two-dimensional matrix code area in the image, and

setting inspection lines identifying a center position of each of the cells, said inspection lines each joining two paired opposites of four sides defining a boundary of the decided two-dimensional matrix code area and reproducing information of the two-dimensional matrix code based on the inspection lines set by the inspection line setting processing,

wherein coefficients in image position calculating equations for calculating coordinate positions of center positions of

respective cells in the two-dimensional matrix code compensated for image inclination by adding inclination information for the two-dimensional matrix code are calculated for setting the inspection lines on the two-dimensional matrix code image based on coordinate positions of four points within the two-dimensional matrix code area decided by the two-dimensional matrix code area deciding step.

2. (*Currently amended*) The two-dimensional code reading method as defined in claim **1**, wherein each of the image position calculating equations for determining the coordinate positions of the center positions of the respective cells in the two-dimensional matrix code image is expressed by a recurrence formula with respect to a center position of each of the cells to reduce a volume of calculation for determining the coordinate positions of the center positions of respective cells compensated for image inclination by adding the inclination information of the two-dimensional matrix code.

3. (*Currently amended*) The two-dimensional code reading method as defined in claim **1**, wherein coefficients in the image position calculating equations for calculating coordinate positions at four corners of the two-dimensional matrix code area are divided by a

predetermined same constant to make them integers and the coordinate positions of the cell center positions are determined by calculation with the integers only.

4. (*Currently amended*) The two-dimensional code reading method as defined in claim **1**, wherein a constant for dividing the coefficients symbolically determined for the image position calculating equations and selected from constants frequently and commonly used in the image position calculating equations is used to divide and convert the coefficients to smaller in size coefficients to make the two-dimensional matrix code readable.

5. (*Previously presented*) A two-dimensional code reading method comprising processing steps of:

acquiring an image of a stack type two-dimensional code composed of a number of bar codes arranged in multiple layers in a direction perpendicular to a direction of arrangement of bars in each bar code representing data;

deciding a two-dimensional code area in the image;

setting an inspection line identifying a center position of each of the bar codes, said inspection line joining one of two pairs of opposites of four sides representing a boundary of the decided

two-dimensional code area, said pair opposite to each other in the direction of arrangement of bars in each bar code; and

reproducing information of the two-dimensional code based on the inspection lines set in the inspection line setting step,

wherein coefficients in image position calculating equations for calculating coordinate positions of center positions of respective cells in the two-dimensional code compensated for image inclination by adding inclination information for the two-dimensional code are calculated for setting the inspection lines on the two-dimensional code image based on coordinate positions of four points within the two-dimensional code area decided by the two-dimensional code area deciding step.

6. (*Previously presented*) The two-dimensional code reading program which describes the two-dimensional code reading method defined in claim 5 by program codes executable by a computer.

7. (*Original*) A program recording medium which is readable by a computer and holding thereon the two-dimensional code reading program of claim 6.

8. (*Previously presented*) A two-dimensional code reading device comprising:

an image capturing portion for capturing an image of a matrix type two-dimensional code composed of a number of cells arranged in vertical and horizontal directions to form a matrix of the cells each representing binary coded data,

a two-dimensional code area deciding portion for deciding a two-dimensional code area in the two-dimensional code image,

an inspection line setting portion for setting inspection lines identifying a center position of each of the cells, said inspection lines each joining two paired opposites of four sides defining ~~the~~ a boundary of the decided two-dimensional code area and a decoding portion for reproducing information of the two-dimensional code based on the inspection lines,

wherein the inspection line setting portion based on coordinate positions of four points within the two-dimensional code area decided by the two-dimensional code area deciding portion calculates coefficients for image position calculating equations for determining coordinate positions of center positions of respective cells in the two-dimensional code compensated for the inclination of the image by adding inclination information for the two-dimensional code.

9. (*Previously presented*) The A two-dimensional code reading device as defined in claim 8, wherein each of the image position calculating equations for determining the coordinate positions of the center positions of the respective cells in the two-dimensional code image is expressed by a recurrence formula with respect to a center position of each of the cells to reduce a volume of calculations for determining the coordinate positions of the center positions of respective cells compensated for image inclination by adding the inclination of the two-dimensional code by adding inclination information for the two-dimensional code.

10. (*Previously presented*) The two-dimensional code reading device as defined in claim 8, wherein coefficients in the image position calculating equations for calculating coordinate positions at four corners of the two-dimensional code area are divided by a predetermined same constant to make integers and the coordinate positions of the cell center positions are determined by calculation with the integers only.

11. (*Previously presented*) The two-dimensional code reading device as defined in claim 8, wherein a constant for dividing the coefficients symbolically determined for the image position

calculating equations and selected from constants frequently and commonly used in the image position calculating equations is used to divide and convert the coefficients to smaller in size coefficients to make the two-dimensional code readable.

12. (*Previously presented*) The digital camera incorporating a two-dimensional code reading device as defined in claim **8**.

13. (*Previously presented*) The portable telephone with a digital camera, which incorporates a two-dimensional code reading device as defined in claim **8**.

14. (*Currently amended*) The two-dimensional code reading method as defined in claim **2**, wherein coefficients in the image position calculating equations for calculating coordinate positions at four corners of the two-dimensional matrix code area are divided by a predetermined same constant to make integers and the coordinate positions of the cell center positions are determined by calculation with the integers only.

15. (*Currently amended*) The two-dimensional code reading method as defined in claim **2**, wherein a constant for dividing the coefficients symbolically determined for the image position

calculating equations and selected from constants frequently and commonly used in the image position calculating equations is used to divide and convert the coefficients to smaller in size coefficients to make the two-dimensional matrix code readable.

16. (*Previously presented*) The two-dimensional code reading program which describes the two-dimensional code reading method defined in claim **1** by program codes executable by a computer.

17. (*Previously presented*) A program recording medium which is readable by a computer and holding thereon the two-dimensional code reading program of claim **16**.

18. (*Previously presented*) The two-dimensional code reading device as defined in claim **9**, wherein coefficients in the image position calculating equations for calculating coordinate positions at four corners of the two-dimensional code area are divided by a predetermined same constant to make them integers and the coordinate positions of the cell center positions are determined by calculation with the integers only.

19. (*Previously presented*) The two-dimensional code reading device as defined in claim **9**, wherein a constant for dividing the

coefficients symbolically determined for the image position calculating equations and selected from constants frequently and commonly used in the image position calculating equations is used to divide and convert the coefficients to smaller in size coefficients to make the two-dimensional code readable.